Upper Rapidan River Watershed Implementation Plan

January 28, 2015 and January 29, 2015

Public Meetings

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Blue Ridge Environmental Solutions, Inc.

Why are we here?

- Virginia Department of Environmental Quality has measured excessive fecal bacteria levels in:
  - Rippin Run
  - Blue Run
  - Marsh Run
  - Beautiful Run
  - Poplar Run
  - Unnamed Tributaries to Rapidan River
  - Rapidan River
  - Garth Run

What are fecal bacteria?

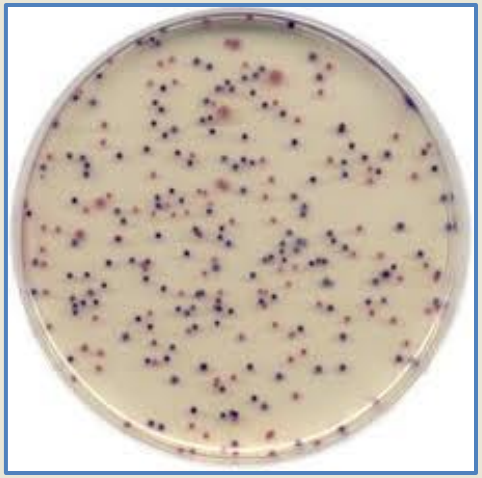
- Bacteria associated with feces from warm-blooded animals (fecal coliform, *E. coli*)

Why should we care?

- Fecal matter can contain bacteria, parasites, & viruses
- Examples: *E. coli* , *Cryptosporidium*, Hepatitis Viruses
- Acute effects (diarrhea and infections)
- Chronic or ultimate effects (ulcers, arthritis, death)

How are excessive fecal bacteria determined?

- DEQ sends water sample to laboratory
- Compare laboratory results to bacteria water quality standard
- Single Sample Maximum
  - 235 colony forming units (cfu) / 100 ml



How are monitoring results used?

- Streams designated as impaired if more than 10.5% of the samples collected during an assessment period exceed the bacteria water quality standard

- Streams designated as impaired are placed on Virginia's Impaired Waters List and reported to the Environmental Protection Agency in accordance with Clean Water Act

Bacteria* Impairments in Virginia for 2014

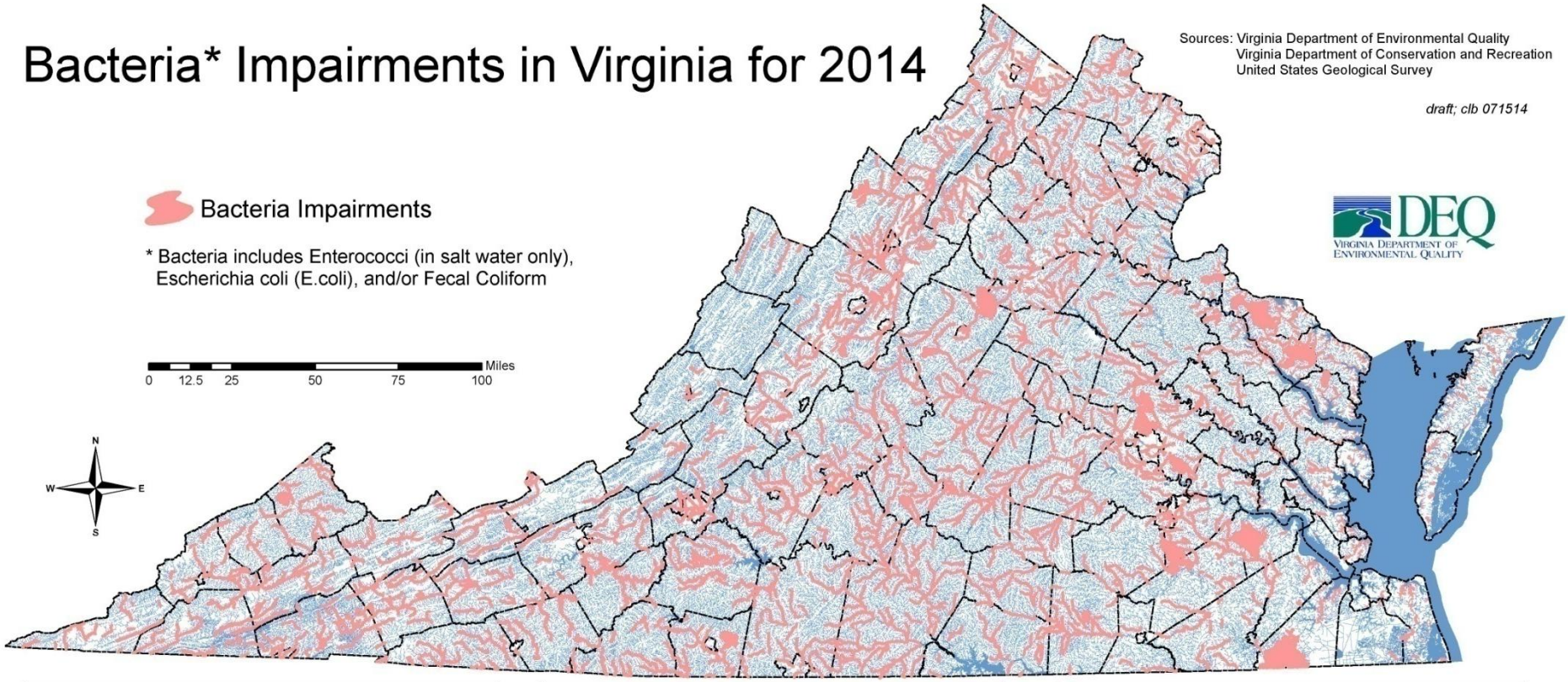
Sources: Virginia Department of Environmental Quality
Virginia Department of Conservation and Recreation
United States Geological Survey

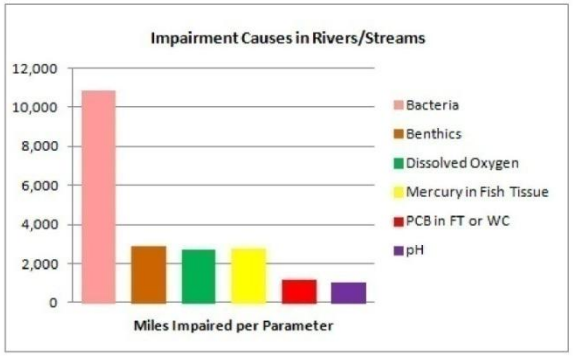
draft; clb 071514

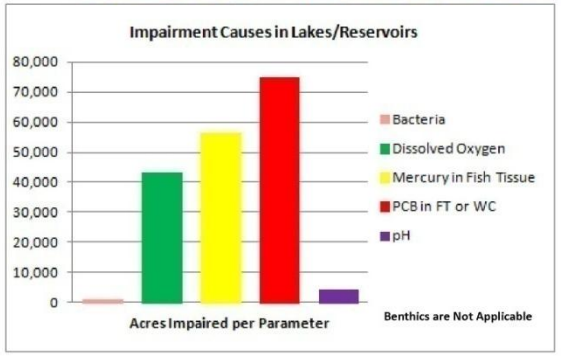
Bacteria Impairments

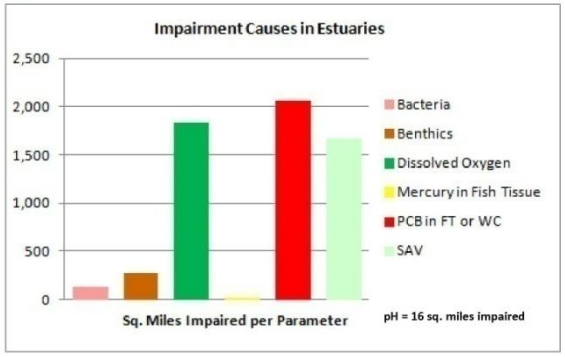
* Bacteria includes Enterococci (in salt water only), Escherichia coli (E.coli), and/or Fecal Coliform

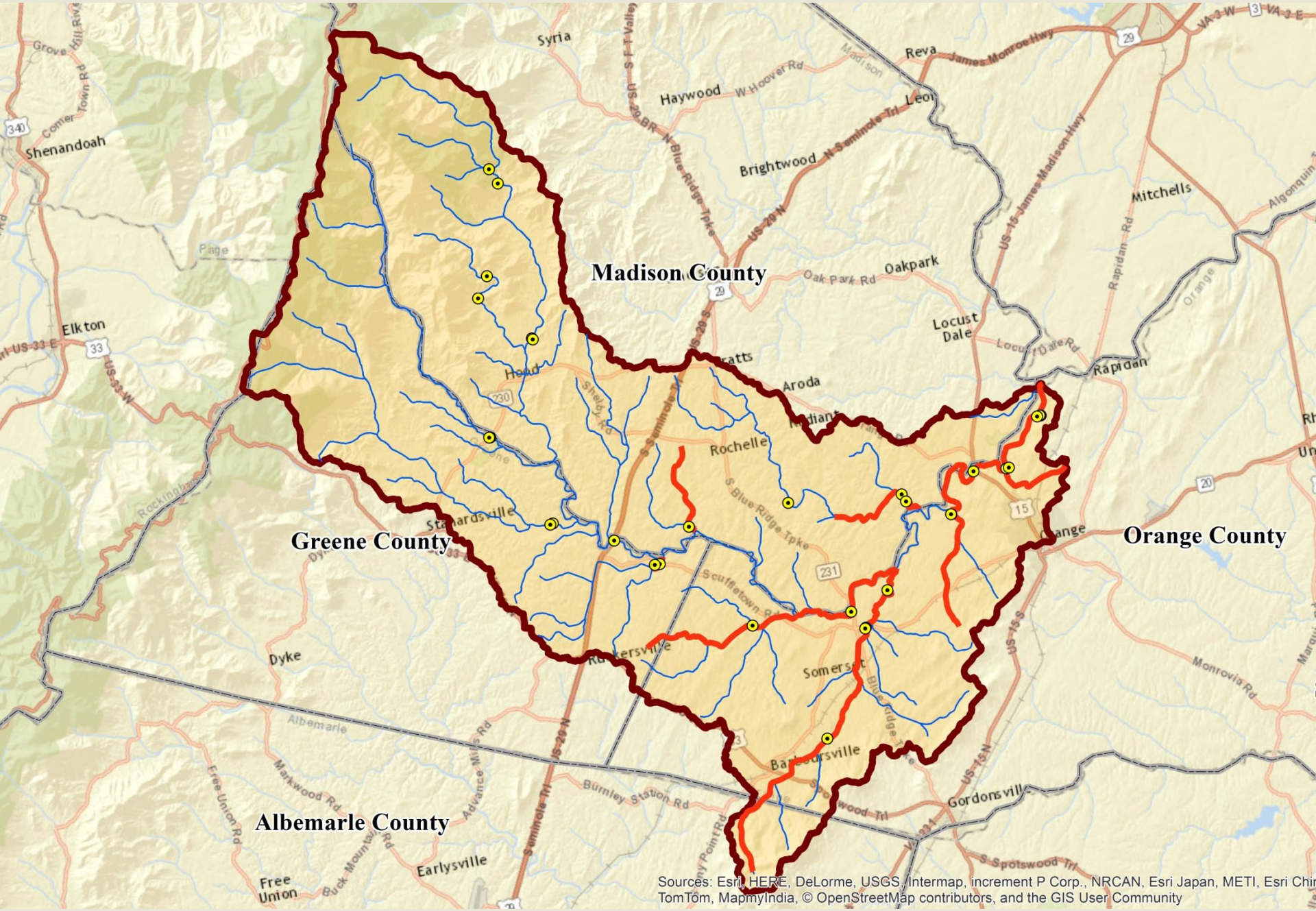
DEQ
Virginia Department of Environmental Quality

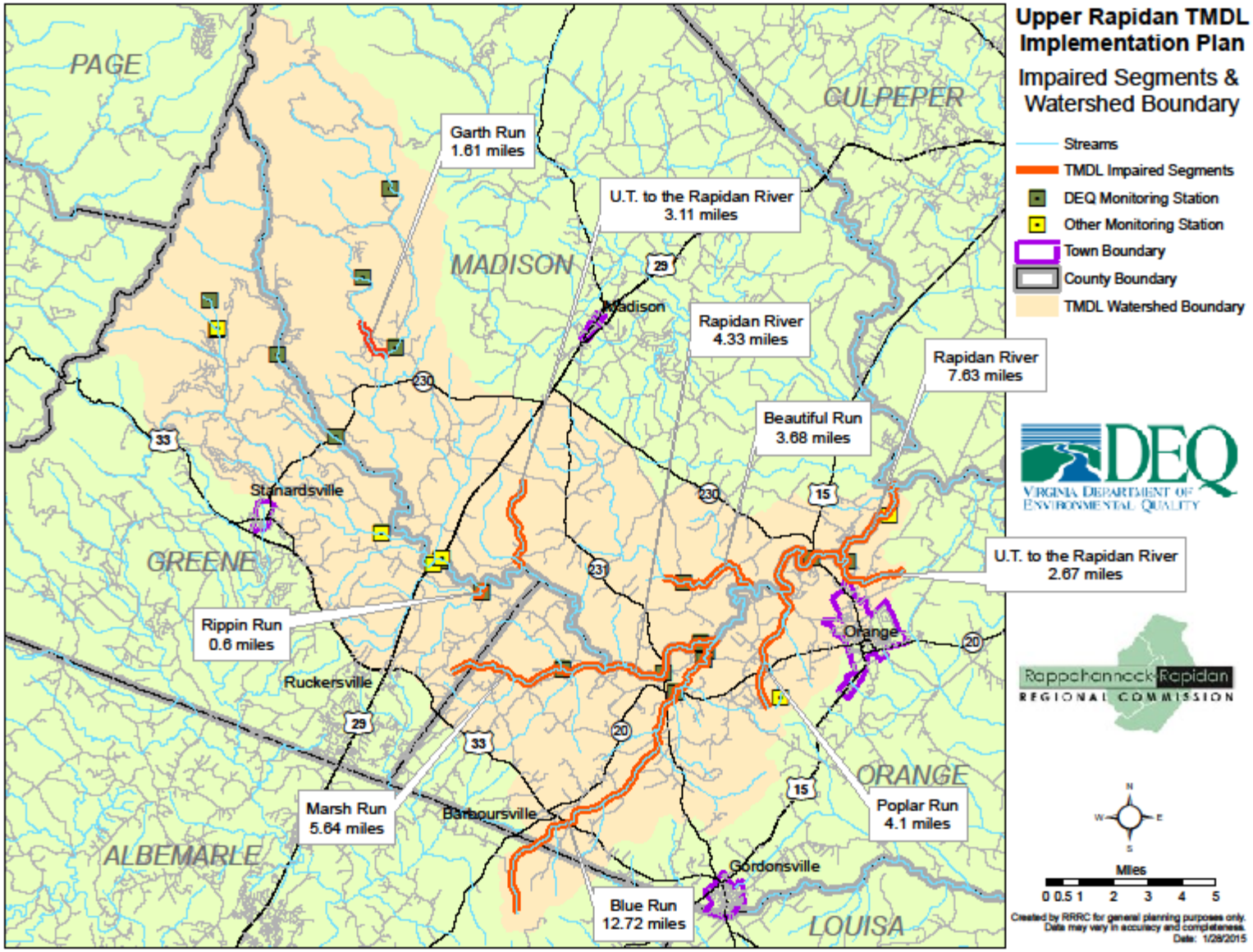









Madison County
Greene County
Orange County
Albemarle County
Syria
Reva
Haywood
Brightwood
Mitchells
Oakpark
Locust Dale
Rapidan
Aroda
Rochelle
Standardsville
Somerset
Dyke
Earlysville
Free Union
Gordonsville
Shenandoah
Elkton
Page
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri Chi
TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Upper Rapidan TMDL Implementation Plan
Impaired Segments & Watershed Boundary
Streams
TMDL Impaired Segments
DEQ Monitoring Station
Other Monitoring Station
Town Boundary
County Boundary
TMDL Watershed Boundary
PAGE
CULPEPER
MADISON
GREENE
ORANGE
ALBEMARLE
LOUISA
Garth Run 1.61 miles
U.T. to the Rapidan River 3.11 miles
Rapidan River 4.33 miles
Rapidan River 7.63 miles
Beautiful Run 3.68 miles
U.T. to the Rapidan River 2.67 miles
Rippin Run 0.6 miles
Marsh Run 5.64 miles
Poplar Run 4.1 miles
Blue Run 12.72 miles
Madison
Standardsville
Ruckersville
Barboursville
Orange
Gordonsville
29
230
33
231
15
20
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Rappahannock-Rapidan
REGIONAL COMMISSION
N
W
E
S
Miles
0 0.5 1 2 3 4 5
Created by RRRC for general planning purposes only.
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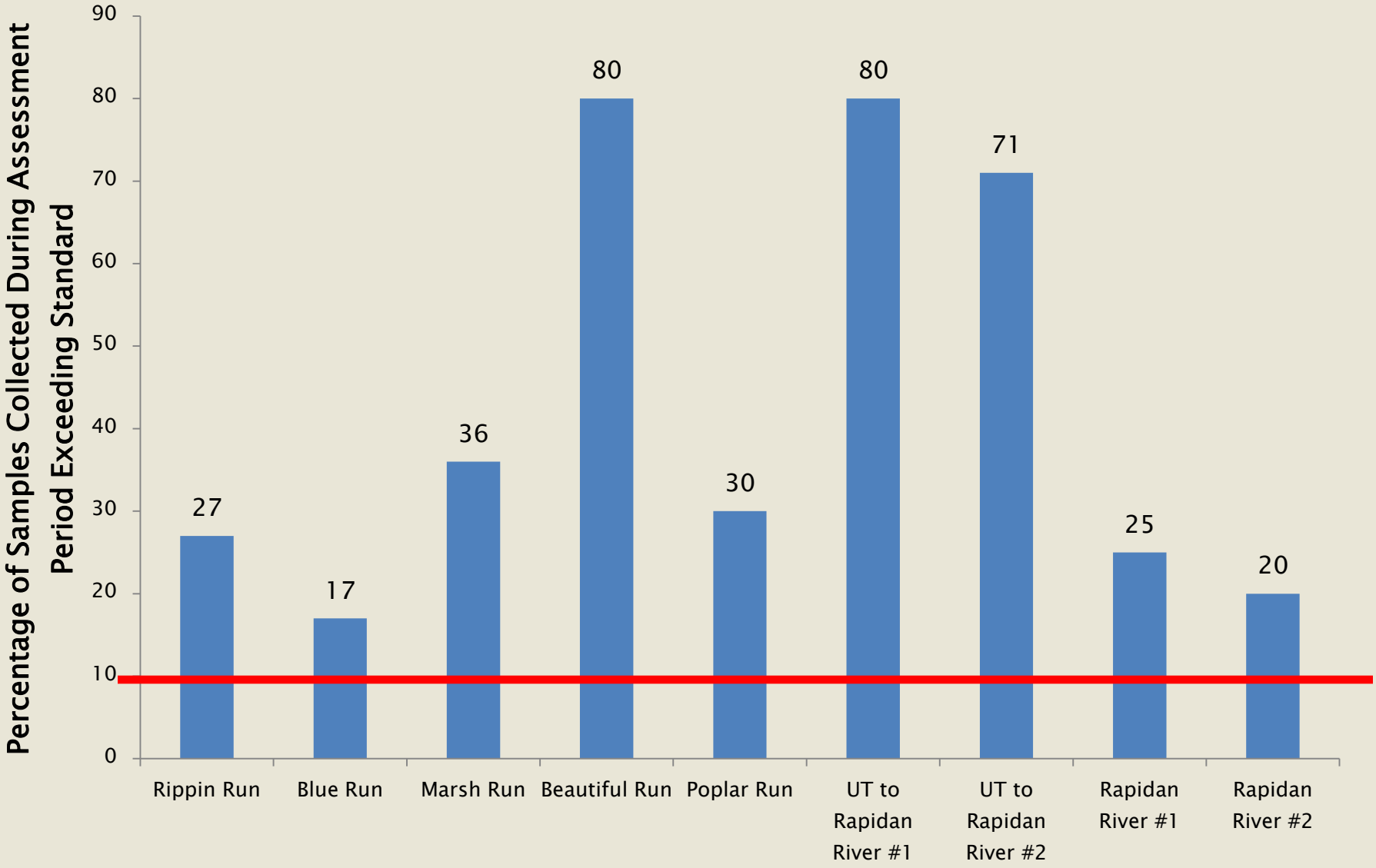
Date: 1/28/2015

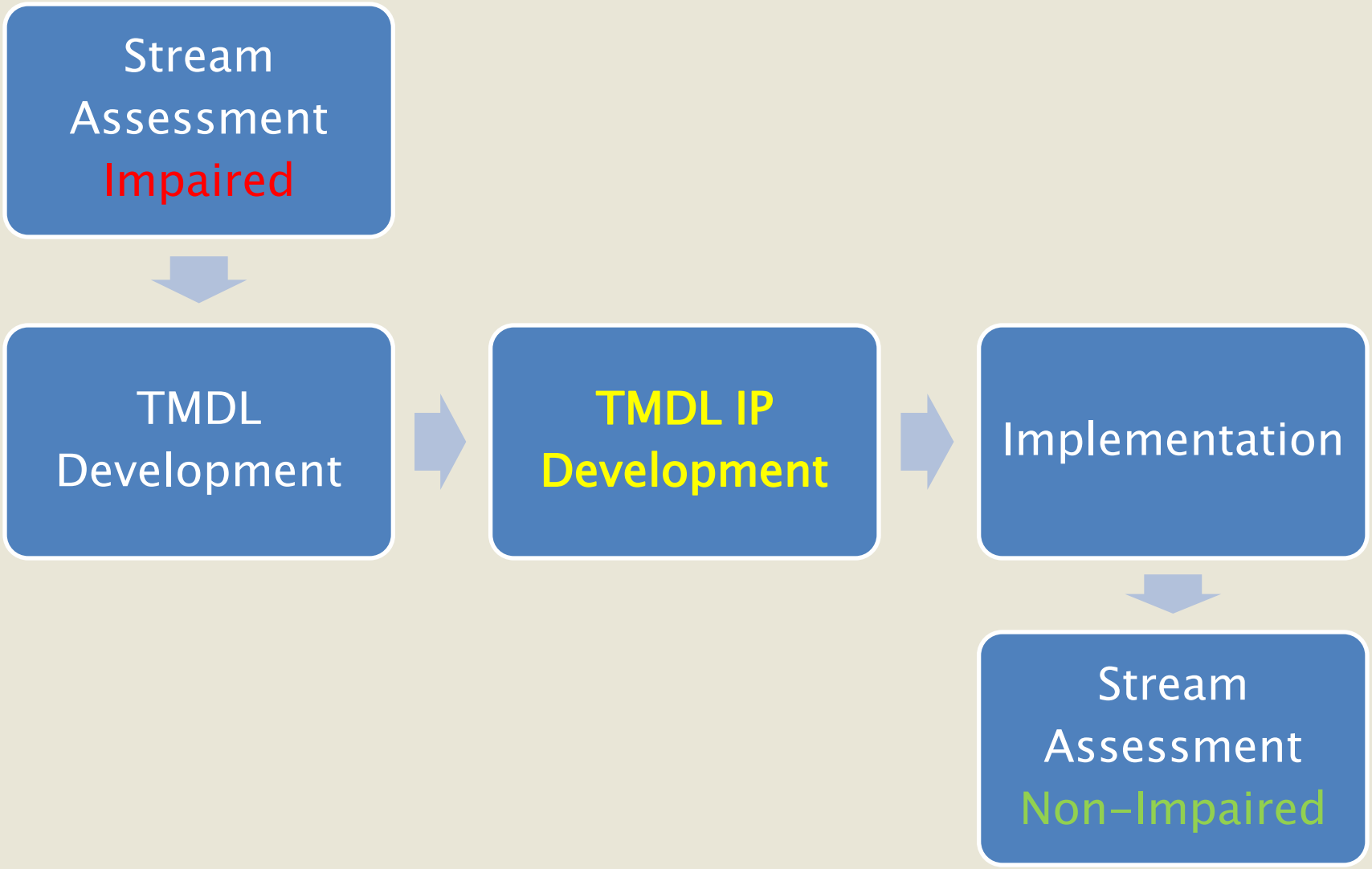
2014 Integrated Report Exceedance Rates



What happens after impairment listing?

- Virginia Department of Environmental Quality completes a Total Maximum Daily Load (TMDL) study for impaired stream
- TMDL develops a "pollution budget" for stream
  - Maximum amount of bacteria the stream can assimilate without exceeding water quality standard
- Virginia law requires a Watershed Implementation Plan be developed for completed TMDLs

What is the TMDL process?



What is included in the TMDL Implementation Plan?

What is needed to reduce bacteria?

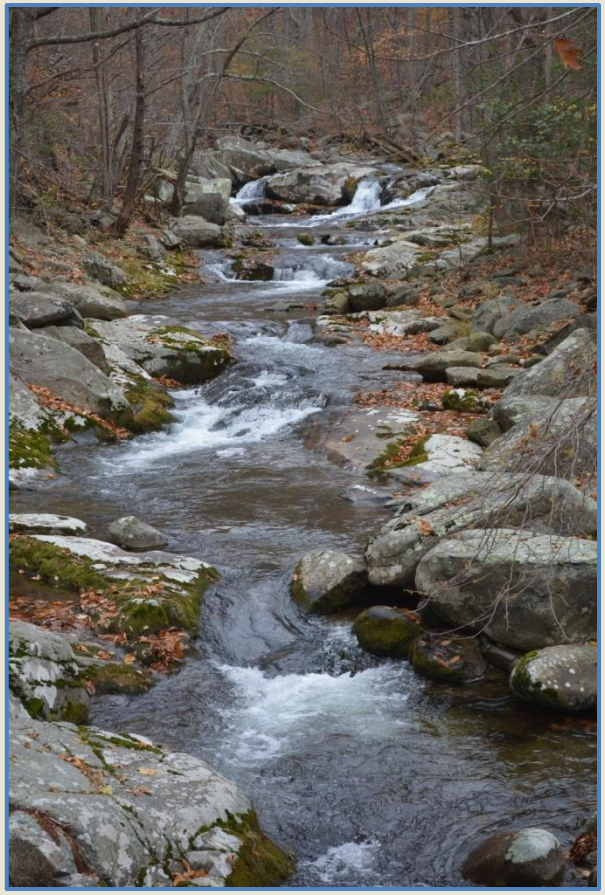
- Review of TMDL Study
- Implementation Actions Quantified
- Cost & Benefits

How is TMDL IP implemented?

- Measurable Goals and Milestones
- Stakeholders' Roles
- Potential Funding Sources

Who determines inputs and outcomes?

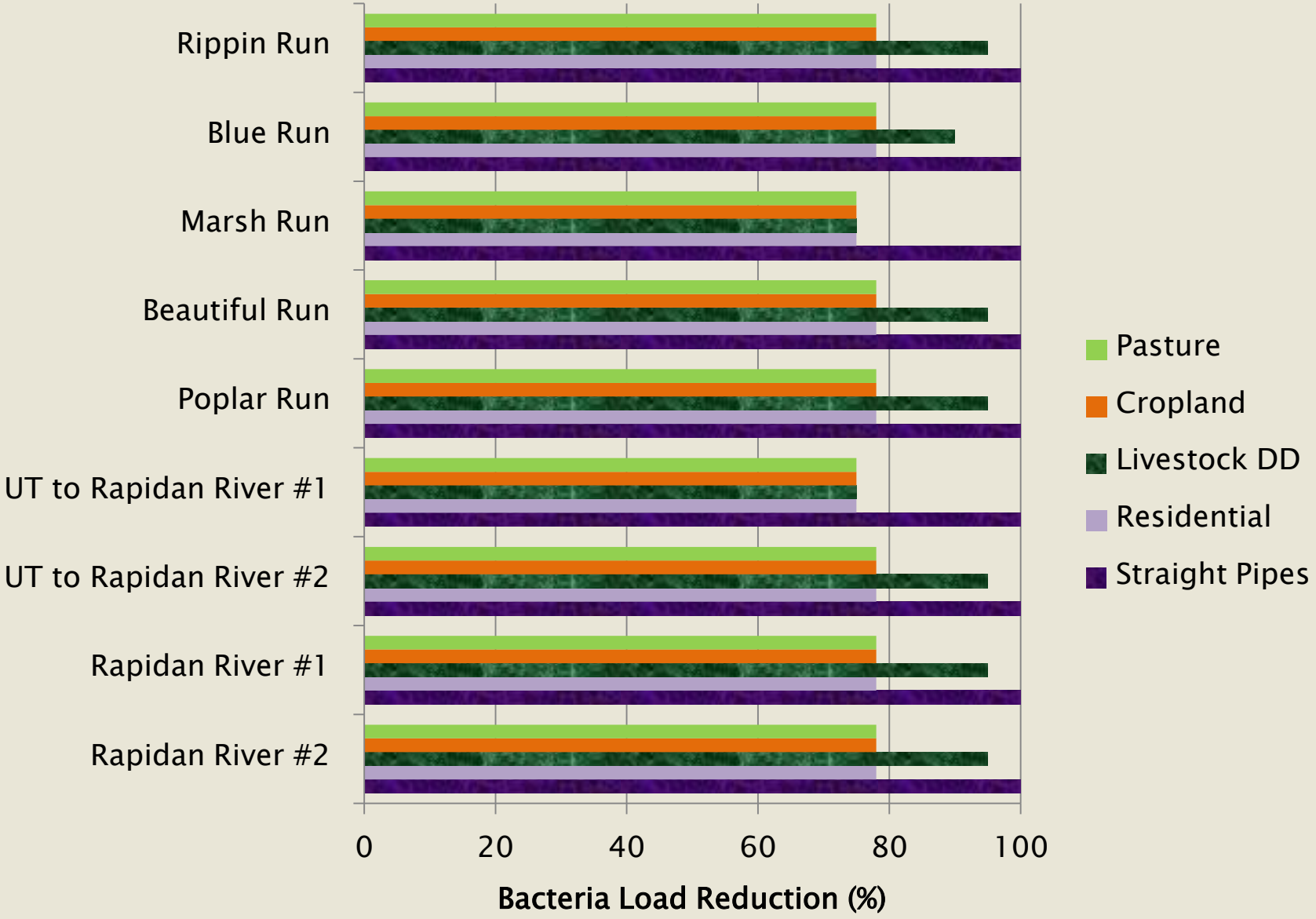
- Public Participation



Bacteria Sources Quantified in TMDL

- **Permitted Sources**
  - Virginia Pollution Discharge Elimination Systems
  - Biosolids
- **Residential**
  - Straight pipes, failing septic systems, pets
  - Direct to stream; residential landuse runoff
- **Agricultural**
  - Dairy, beef, turkey, horse, sheep
  - Direct to stream; pasture & cropland runoff
- **Wildlife**
  - Deer, turkey, goose, ducks, muskrat, raccoon, beaver
  - Direct to stream; forest & agricultural landuse runoff

Bacteria Load Reduction Needed (Stage I)



TMDL Implementation Strategy

- Exclude livestock from stream corridor
- Improve pasture & cropland management
- Remove straight pipes
- Repair / replace failing septic systems
- Better manage pet waste

Straight Pipe

Livestock Stream Access

Failed Septic System

Implementation Actions

- Identify control measures to reduce bacteria
- Quantify control measures and technical assistance needed to implement actions
- Estimate cost to implement
- Determine benefits of implementation
  - Environmental, economic, human & herd health

Residential Runoff

Pastured Livestock

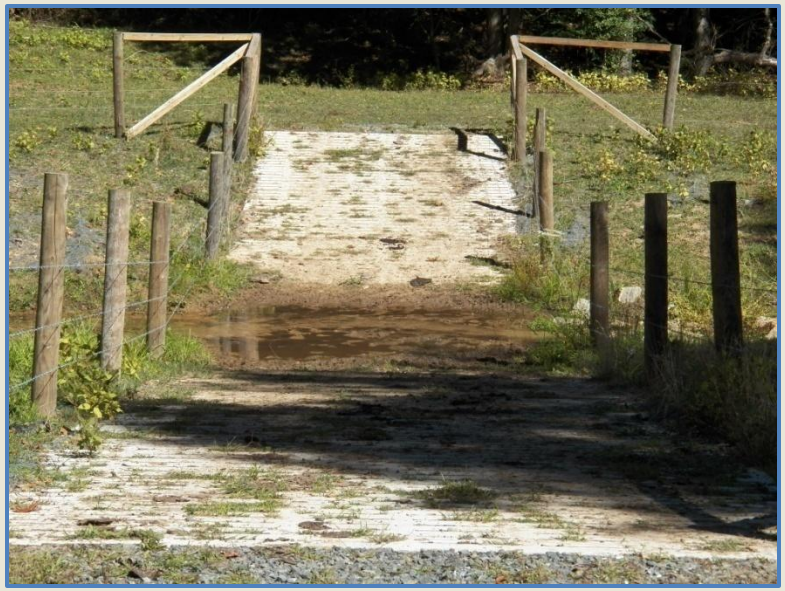
Manure Application

Potential Agricultural Control Measures

Control Measure	Delivery Pathway to Stream	
	Direct	Runoff
Livestock Exclusion and Pasture		
Livestock Exclusion System with 35’ Buffer	√	√
Livestock Exclusion with 10’ Setback	√	√
Small Acreage Grazing System	√	√
Stream Protection	√	√
Improved Pasture Management		√
Cropland		
Animal Waste Storage Facility		√
Permanent Vegetative Cover on Cropland		√
Reforestation of Erodible Crop & Pastureland		√
Manure Incorporation into Soil		√

Exclusion Fencing & Riparian Buffer

Watering Trough



Hardened Crossing

Rotational Grazing

Dairy Liquid Manure Tank

Beef Waste Storage Facility

Poultry Litter Shed



Permanent Vegetative Cover


Reforestation

Potential Residential Control Measures

Control Measure	Delivery Pathway to Stream	
	Direct	Runoff
On-site Sewage Disposal Systems		
Septic Tank Pump-outs		√
Hook-up to Sanitary Sewer	√	√
Septic System Repair		√
New Conventional Septic System	√	√
New Conventional Septic System with Pump	√	√
New Alternative On-site Sewage Disposal System	√	√
Pet Waste Management		
Pet Waste Education Program		√
Pet Waste Enzyme Digesting Composters		√
Confined Canine Unit Waste Treatment System	√	√
Stormwater Runoff Best Management Practices		
Vegetated Buffers		√
Rain Gardens		√
Infiltration Trenches		√

Septic System Pump-out

Septic System Replacement

Septic System Repair

Alternative On-site
Sewage Disposal System

Pet Waste Composters

CCU Waste Treatment

Vegetated Buffer

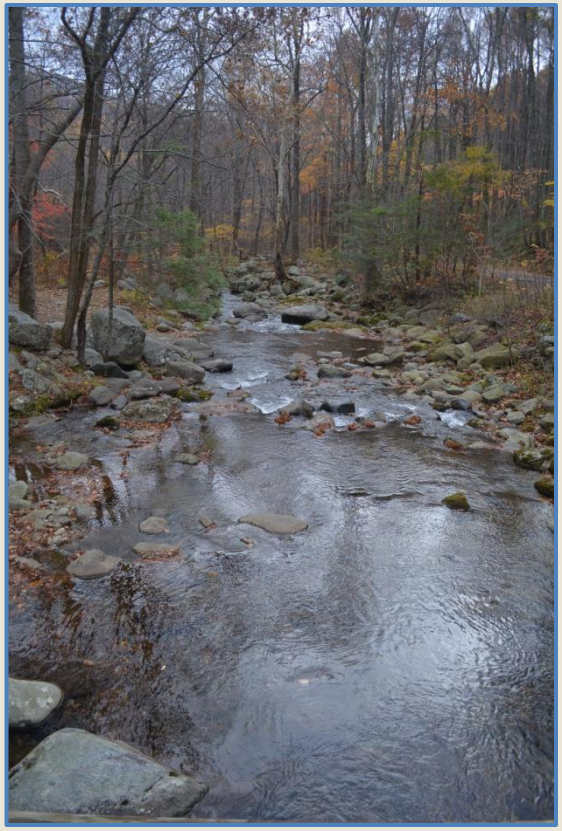
Pet Waste Station

Bioretention (rain garden)

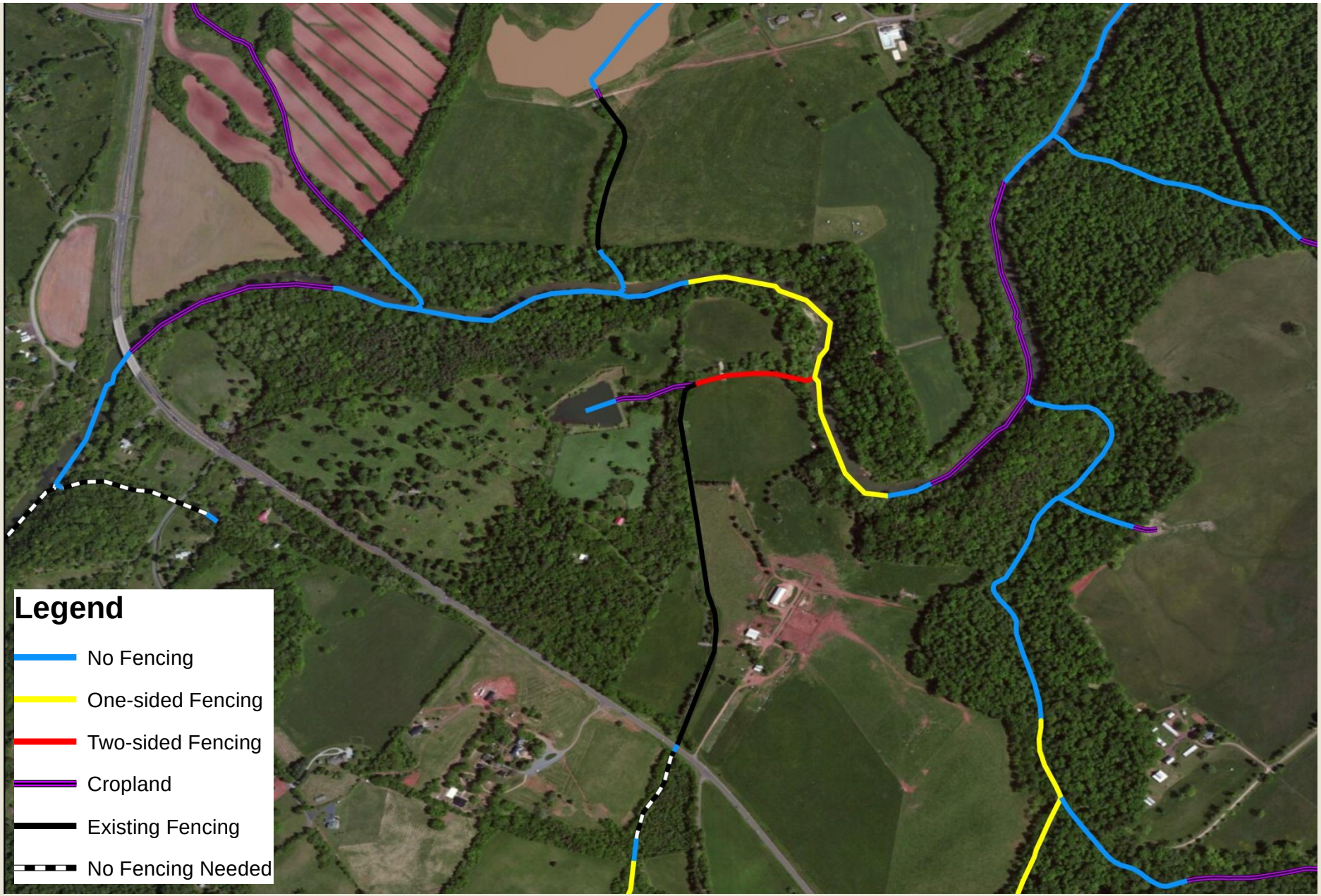
Infiltration Trench

Control Measure Quantification

- Spatial analysis (e.g., GIS)
- DCR Agricultural BMP Database
- SWCD, VDH, & DEQ records
- TMDL development document
- Input from working groups and steering Committee



Spatial Analysis: Livestock Stream Exclusion



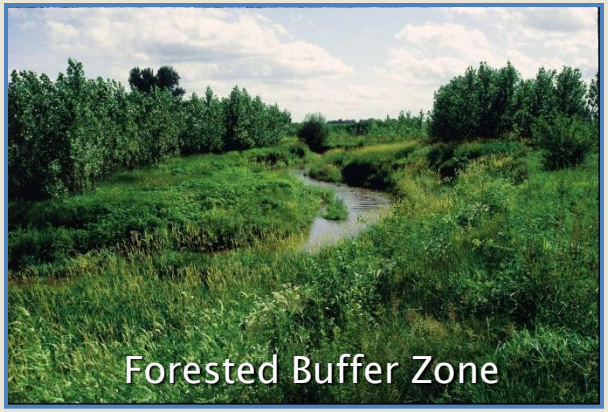
Implementation Cost

- Control Measure Installation Cost
  - Number of units multiplied by unit cost
- Technical Assistance (TA)
  - Full time equivalents multiplied by unit cost
- Total Cost = Installation Cost + TA Cost

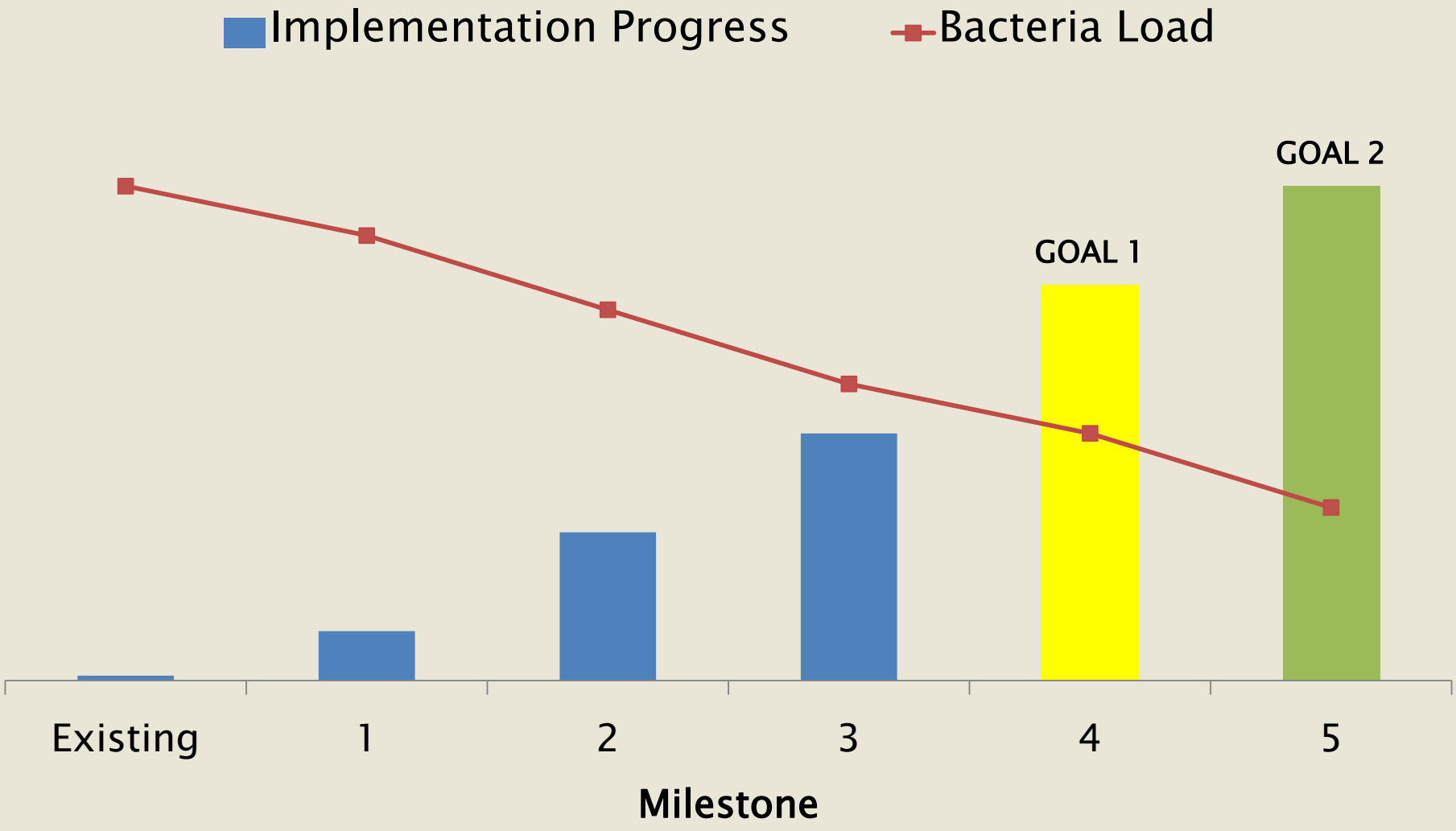
Measurable Goals & Milestones

- **Establish Goals**
  - Removal from Impaired Waters List
  - Meet TMDL Allocations
- **Create milestones**
  - Implementation
  - Water quality
- **Evaluate progress**
  - SWCD and VDH track installations
  - VADEQ monitors water quality
  - Steering Committee reviews and suggests changes if milestones not being met


Exclusion Fencing with Buffer


Forested Buffer Zone

Evaluate Progress



Stakeholders

Regional / Local

- Counties & Towns landowners and governments
- Soil and Water Conservation Districts
- Local Watershed Groups
- Rappahannock Rapidan Regional Commission

State

- Department of Conservation and Recreation
- Department of Environmental Quality
- Department of Health
- Department of Agricultural & Consumer Services
- Cooperative Extension
- Department of Forestry
- Department of Game and Inland Fisheries
- Virginia Outdoors Foundation

Federal

- USDA – Natural Resources Conservation Service
- United States Environmental Protection Agency

Potential Funding Sources

Federal

- Federal Clean Water Act Section 319 Incremental Funds
- USDA Conservation Reserve Enhancement Program (CREP)
- USDA Conservation Reserve Program (CRP)
- USDA Environmental Quality Incentives Program (EQIP)
- USDA Wildlife Habitat Incentive Program (WHIP)
- USDA Wetland Reserve Program (WRP)
- USDA Regional Conservation Partnership Program (RCPP)
- U.S. Fish & Wildlife Service Private Stewardship Program
- U.S. Fish & Wildlife Service Conservation Grants

Potential Funding Sources

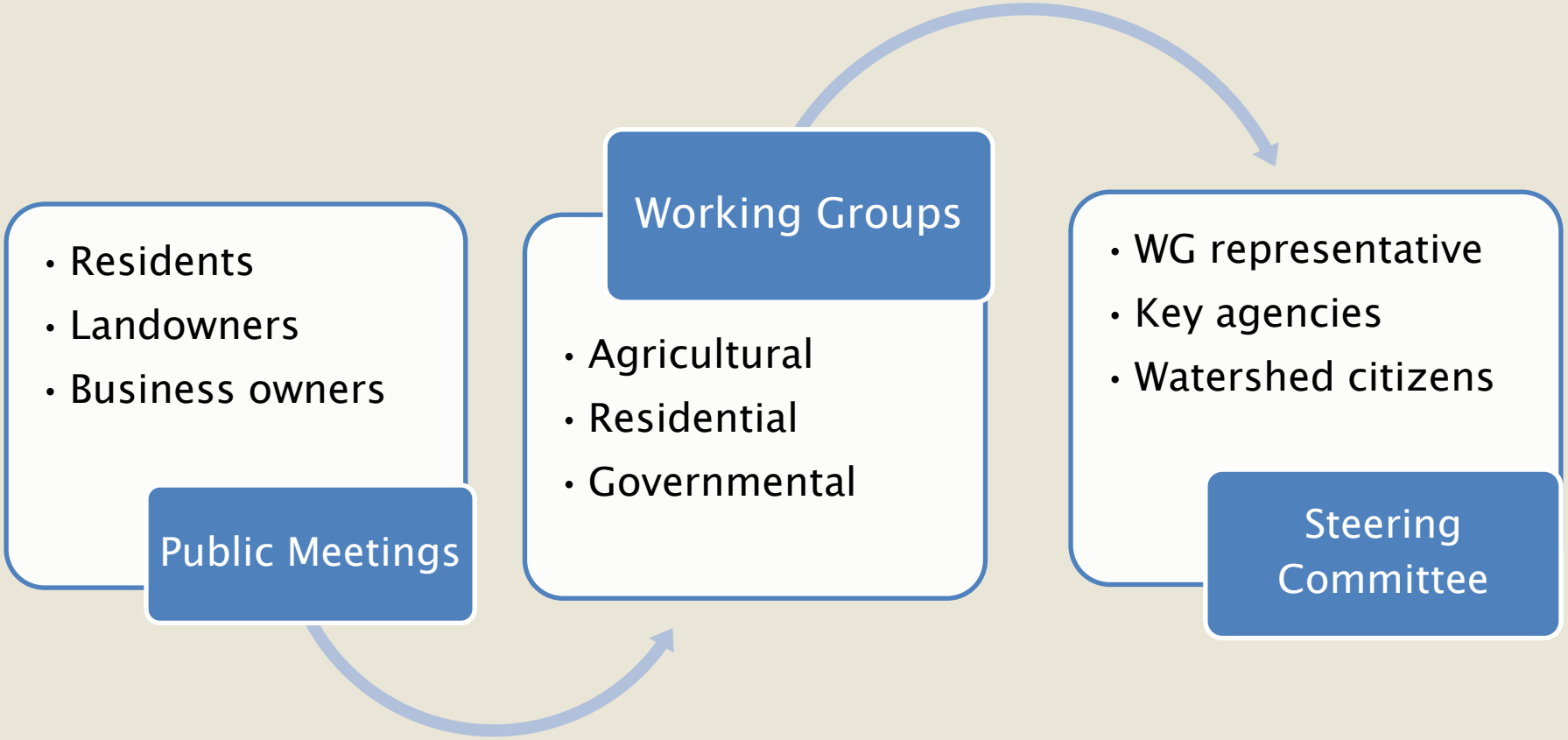
State

- VA Agricultural BMP Cost-share & Tax Credit Programs
- VA Water Quality Improvement Fund
- VA Forest Stewardship Program
- VA Small Business Environmental Compliance Assistance Fund
- VA Clean Water Revolving Loan Programs
- VA Outdoors Foundation
- Community Development Block Grant Program

Regional, Local, Private

- Southeast Rural Community Assistance Project
- National Fish and Wildlife Foundation
- Trout Unlimited
- Center for Natural Capital
- DOF Urban Trees

Public Participation



Public Meetings

- Provide forum for public comment
- First meeting
  - Offer overview of TMDL program
  - Kick-off implementation plan process
  - Solicit participation in working groups and establish steering committee
- Final meeting
  - Present draft TMDL Implementation Plan

Working Groups

- Inform Resource Team about perceived pollutant sources
- Enlighten Resource Team about on-going/needed pollution control activities
- Review possible implementation strategies from an interest-based perspective
- Discuss alternative funding
- Identify outreach methods for engaging peers in implementing pollution control measures
- Identify constraints to implementing pollution control measures

Steering Committee

- Provides overall oversight in IP process
- Examines recommendations from working groups and public meetings
- Reviews watershed implementation plan
- Continues oversight during implementation and revises plan if needed

Roles Citizens Can Play During Implementation Plan Development

- Provide additional detail on watershed
- Review/suggest implementation strategies
- Identify potential implementation impediments
- Identify local funding sources/partnerships
- Assist with implementation projects

Project Timeline

January
- First Public Meetings
- AWG and RWG Meetings

March
- AWG and RWG Meetings

April
- AWG and RWG Meetings
- GWG Meeting

May
- Steering Committee Meeting

June
- Final Public Meetings
- Draft Implementation Plan

July
- Final Implementation Plan
- Technical Report

One Last Point to Remember

TMDLs and IPs are a mechanism for restoring water quality and are an opportunity for diverse groups of people to come together to improve watershed health

For Information & Comments:

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Comments requested before February 27, 2015